Geochemical characteristics of tin-tungsten mineralizing fluids at Panasqueira, Portugal

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Tungsten has many industrial applications due to its heat resistance, density and hardness (tungsten carbides). Tungsten deposits typically form due to the interaction of a magmatic-derived fluid with the rocks in which the deposit is emplaced or with other fluids. However there are no modern quantitative analytical studies of the fluids responsible for the formation of the highest-grade deposit type (tungsten vein deposits) [1]. Panasqueira (Portugal) is a tungsten vein deposit, one of the leading tungsten producers in Europe and one of the best geologically characterized tungsten vein deposits [2].

In this study, compositions of the mineralizing fluids at Panasqueira have been determined through combination of detailed petrography, microthermometric measurements and LA-ICPMS analyses. We characterize the fluids related to the various mineralizing stages in the system: the oxide stage (tin and tungsten mineralization)- and the sulfide stage (chalcopyrite and sphalerite mineralization). Thus, our results provide information on the properties of fluids related with specific paragenetic stages.

This study provides the first quantitative analytical data on fluid composition for tungsten vein deposits and thus helps to constrain the mechanisms of formation of the Panasqueira tin-tungsten deposit.

[1] Bodnar *et al* (2014) *Treatise Geochem.* **13**, 119-142 [2] Kelly and Rye (1979) *Econ. Geol.* **74**, 1721-1822